IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. *(Currently Amended):* An information reproducing apparatus for performing maximum-likelihood decoding ~~by reading out information recorded on a recording medium~~, comprising:

a detecting section which detects information recorded in the recording medium and which outputs a reproduction signal;

an equalizing section which performs partial response equalization of ~~a detection signal detected by the detecting section~~ the reproduction signal and which outputs an equalized signal;

a correcting section which corrects the potential of the equalized signal ~~output from the equalizing section~~ in accordance with a correction amount determined on the basis of a plurality of reference levels ~~that is~~ used for the maximum-likelihood decoding, to produce a corrected equalizing signal; and

a maximum-likelihood decoding section which performs maximum-likelihood decoding of the corrected equalizing signal by referencing the plurality of reference levels, ~~in accordance with the equalized signal corrected by the correcting section~~, and which outputs a ~~decoding~~ decoded signal;

wherein, the plurality of reference levels used for the maximum-likelihood decoding are represented by LV(1), LV(2), ..., LV(n−1), and LV(n) in sequence from the lowest level, and a plurality of levels for peaks in a histogram of equalized signals and that correspond to the reference levels are represented by LP(1), LP(2), ..., LP(n−1), and LP(n) in sequence from the peak level whose value is smallest, the correction amount is determined by the correcting section to generate a value satisfying one of:

$LP(1) = LV(1) − \alpha$ (where α is a constant), and

$LP(n) = LV(n) + \alpha$, and

wherein the constant α is the same as a value LVd equal to each of the intervals between the plurality of reference levels used for the maximum-likelihood decoding and,

based on the correction amount, the correcting section corrects a corresponding equalized signal level.

2. -3. (*Cancelled*).

4. (*Currently Amended*): An information reproducing apparatus according to claim 1, wherein the correction amount ~~to be determined by the correcting section~~ is a value determined such that at least one of the corrected values of the plurality of ~~peak~~ levels for peaks in ~~the~~ a histogram of the equalized signals ~~that correspond to the reference levels and that are output from the equalizing section~~ matches at least one of the values of the plurality of reference levels ~~that are~~ used for the maximum-likelihood decoding.

5. (*Currently Amended*): An information reproducing apparatus according to claim 1, wherein the correction amount ~~to be determined by the correcting section~~ is a value determined such that at least one of the corrected values of the plurality of ~~peak~~ levels for peaks in ~~the~~ a histogram of the equalized signals that correspond to left and right reference levels adjacent to a central reference level used for the maximum-likelihood decoding matches at least one of the values of the left and right reference levels adjacent to the central reference level ~~of the plurality of reference levels that are used for the maximum-likelihood decoding~~.

6. (*Currently Amended*): An information reproducing apparatus according to claim 1, wherein when levels for peaks in a histogram of the equalized signals ~~has an asymmetric~~ have a distribution asymmetric ~~including a fine portion and a coarse portion~~ with respect to ~~a~~ ~~peak level corresponding to~~ a central reference level of the plurality of reference levels used for the maximum-likelihood decoding, such that the distribution has a fine portion and a coarse portion, the correction amount ~~to be determined by the correcting section~~ is a value determined such that~~, in~~ of left and right reference levels adjacent to the central reference level of the plurality of reference levels ~~that are~~ used for the maximum-likelihood decoding, a value of the reference level on the side where the distribution includes the fine portion matches a corrected value of a corresponding peak level ~~corresponding to the value of the reference level~~.

7. *(Currently Amended):*An information reproducing apparatus according to claim 1, wherein the correction amount ~~to be determined by the correcting section~~ is a value determined such that <u>at least one of</u> reference levels provided at second left and right ~~portions from~~ <u>displacements from</u> a central reference level of the plurality of reference levels ~~that are~~ used for the maximum-likelihood decoding matches at least one of <u>the</u> corrected values of a plurality of <u>corresponding</u> ~~peak~~ levels <u>for peaks in a histogram</u> of the equalized signals ~~corresponding to the reference levels provided at the second left and right portions from the central reference level~~.

8. *(Currently Amended):*An information reproducing apparatus according to claim 1, wherein when <u>levels for peaks in</u> a histogram of the equalized signals ~~has an~~ <u>have a</u> <u>distribution</u> asymmetric ~~component distribution including a fine portion and a coarse portion~~ with respect to a peak level corresponding to a central reference level the reference levels, <u>including a fine portion and a coarse portion,</u> the correction amount ~~to be determined by the correcting section~~ is a value determined such that, in reference levels provided in second left and right portions of the plurality of reference levels ~~that are~~ used for the maximum-likelihood decoding, a value of the reference level on the side where the distribution includes the fine portion matches a corrected value of a <u>corresponding</u> peak level ~~corresponding to the value of the reference level~~.

9. *(Currently Amended):* ~~An information reproducing apparatus according to claim 1,~~ <u>An information reproducing apparatus for performing maximum-likelihood decoding, comprising:</u>

<u>a detecting section which detects information recorded in the recording medium and which outputs a reproduction signal;</u>

<u>an equalizing section which performs partial response equalization of the reproduction signal and which outputs an equalized signal;</u>

<u>a correcting section which corrects the potential of the equalized signal in accordance with a correction amount determined on the basis of a plurality of reference levels used for the maximum-likelihood decoding, to produce a corrected equalizing signal; and</u>

<u>a maximum-likelihood decoding section which performs maximum-likelihood decoding of the corrected equalizing signal by referencing the plurality of reference levels, and which outputs a decoded signal;</u>

wherein ~~when~~ representing the plurality of reference levels ~~that are~~ used for the maximum-likelihood decoding ~~are represented~~ by LV(1), LV(2), ..., LV(n-1), and LV(n) in sequence from the ~~lower~~ lowest level and ~~when~~ representing a plurality of ~~peak~~ levels for peaks in a histogram of equalized signals and that correspond to the reference levels ~~and that are output from the equalizing section are represented~~ by LP(1), LP(2), ..., LP(n-1), and LP(n) in sequence from the peak level whose corrected value is ~~smaller~~ smallest, a value LVd ~~represented by each interval~~ equal to the intervals between the plurality of reference levels ~~that are~~ used for the maximum-likelihood decoding is used to perform ~~output~~ restriction ~~for~~ of the equalized ~~signals~~ signal values to ~~signals in~~ a range between LP(1) $-$ 1/2·LVd and LP(n) $+$ 1/2·LVd.

10. *(Currently Amended):* An information reproducing apparatus according to claim 1, wherein the correcting section performs correction by using a variable gain amplifier whose amplification factor can be changed ~~corresponding to~~ by an external ~~signals~~ signal.

11. *(Currently Amended):* An information reproducing method for performing maximum-likelihood decoding ~~by reading out information recorded on a recording medium~~, comprising:

detecting information recorded in ~~the~~ a recording medium and outputting a reproduction signal;

performing partial response equalization of ~~a detection signal detected by~~ the reproduction signal ~~detecting section~~ and outputting an equalized signal;

producing a corrected equalized signal by correcting the potential of the equalized signal in accordance with a correction amount determined on the basis of a plurality of reference levels ~~that are~~ used for the maximum-likelihood decoding; and

performing the maximum-likelihood decoding of the corrected equalized signal by referencing the plurality of reference levels~~, in accordance with the equalized signal corrected by the correcting section~~ and outputting a decoded signal,

wherein, the plurality of reference levels used for the maximum-likelihood decoding are represented by LV(1), LV(2), ..., LV(n-1), and LV(n) in sequence from the lowest level, and a plurality of levels for peaks in a histogram of equalized signals and that correspond to the reference levels are represented by LP(1), LP(2), ..., LP(n-1), and LP(n) in sequence

from the peak level whose value is smallest, the correction amount is determined by the correcting section to generate a value satisfying one of:

$$LP(1) = LV(1) - \alpha \text{ (where } \alpha \text{ is a constant), and}$$

$$LP(n) = LV(n) + \alpha, \text{ and}$$

wherein the constant α is the same as a value LVd equal to each of the intervals between the plurality of reference levels used for the maximum-likelihood decoding and, based on the correction amount, the correcting section corrects a corresponding equalized signal level.

12. -13. (*Cancelled*).

14. *(Currently Amended):* An information reproducing method according to claim 11, wherein the correction amount is a value determined such that at least one of the corrected values of the plurality of ~~peak~~ levels for peaks in ~~the~~ a histogram of the equalized signals ~~that correspond to the reference levels~~ matches at least one of the values of the plurality of reference levels ~~that are~~ used for the maximum-likelihood decoding.

15. *(Currently Amended):* An information reproducing method according to claim 11, wherein the correction amount is a value determined such that at least one of the corrected values of the plurality of ~~peak~~ levels for peaks in ~~the~~ a histogram of the equalized signals that correspond to left and right reference levels adjacent to a central reference level used for the maximum-likelihood decoding matches at least one of the values of the left and right reference levels adjacent to the central reference level ~~of the plurality of reference levels that are used for the maximum-likelihood decoding~~.

16. *(Currently Amended):* An information reproducing method according to claim 11, wherein, when levels for peaks in a histogram of the equalized signals ~~has an asymmetric~~ have a distribution that is asymmetric ~~including a fine portion and a coarse portion~~ with respect to a ~~peak level corresponding to a~~ central reference level of the plurality of reference levels used for the maximum-likelihood decoding, such that the distribution has a fine portion and a coarse portion, the correction amount is a value ~~determined~~ such that, ~~in~~ of left and right reference levels adjacent to the central reference level of the plurality of reference levels ~~that are~~ used for the maximum-likelihood decoding, a value of the reference level on the side

where the distribution includes the fine portion matches a corrected value of a <u>corresponding</u> peak level ~~corresponding to the value of the reference level~~.

17. *(Currently Amended):* An information reproducing method according to claim 11, wherein the correction amount is a value determined such that<u>, at least one of</u> reference levels provided at second left and right ~~portions~~ <u>displacements</u> from a central reference level of the plurality of reference levels ~~that are~~ used for the maximum-likelihood decoding matches at least one of <u>the</u> corrected values of a plurality of ~~peak~~ levels <u>for peaks in a</u> <u>histogram</u> ~~of the equalized signals corresponding to the reference levels provided at the second left and right portions from the central reference level~~.

18. *(Currently Amended):* An information reproducing method according to claim 11, wherein, when <u>levels for peaks in</u> a histogram of the equalized signals ~~has an~~ <u>have a</u> <u>distribution that is</u> asymmetric ~~component distribution including a fine portion and a coarse portion~~ with respect to a peak level corresponding to a central reference level the reference levels, <u>including a fine portion and a coarse portion</u>, the correction amount is a value determined such that, in reference levels provided in second left and right portions of the plurality of reference levels ~~that are~~ used for the maximum-likelihood decoding, a value of the reference level on the side where the distribution includes the fine portion matches a corrected value of a <u>corresponding</u> peak level ~~corresponding to the value of the reference~~ ~~level~~.

19. *(Currently Amended):* ~~An information reproducing method according to claim~~ ~~11,~~ <u>An information reproducing method for performing maximum-likelihood decoding,</u> <u>comprising:</u>
<u>detecting information recorded in a recording medium and outputting a reproduction</u> <u>signal;</u>
<u>performing partial response equalization of the reproduction signal and outputting an</u> <u>equalized signal;</u>
<u>producing a corrected equalized signal by correcting the potential of the equalized</u> <u>signal in accordance with a correction amount determined on the basis of a plurality of</u> <u>reference levels used for the maximum-likelihood decoding; and</u>

performing the maximum-likelihood decoding of the corrected equalized signal by referencing the plurality of reference levels and outputting a decoded signal,

wherein ~~when~~ representing the plurality of reference levels ~~that are~~ used for the maximum-likelihood decoding ~~are represented~~ by LV(1), LV(2), ..., LV(n−1), and LV(n) in sequence from the ~~lower~~ lowest level and ~~when~~ representing a plurality of ~~peak~~ levels for peaks in a histogram of equalized signals and that correspond to the reference levels ~~and that are output from the equalizing section are represented~~ by LP(1), LP(2), ..., LP(n−1), and LP(n) in sequence from the peak level whose corrected value is ~~smaller~~ smallest, a value LVd ~~represented by each interval~~ equal to the intervals between the plurality of reference levels ~~that are~~ used for the maximum-likelihood decoding is used to perform ~~output~~ restriction ~~for~~ of the equalized ~~signals~~ signal values to ~~signals in~~ a range between LP(1) − 1/2·LVd and LP(n) + 1/2·LVd.

20. *(Currently Amended):* An information reproducing method according to claim 11, wherein the correction of the equalized signals is performed by using a variable gain amplifier whose amplification factor can be changed ~~corresponding to~~ by an external ~~signals~~ signal.